

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-39 (Cancelled)

40. (Previously presented) A method of decoding the position of bioactive agents attached to microspheres on an array substrate comprising:

a) providing an array substrate comprising a population of microspheres comprising at least a first and a second subpopulation, wherein the microspheres of each subpopulation comprise:

- i) a bioactive agent;
- ii) at least a first and a second identifier binding ligand (IBL), wherein said first and second IBLs are different from said bioactive agent and wherein said IBLs are attached to said microsphere; and

b) detecting both the first and second IBLs to decode the position of each of said bioactive agents on said substrate.

41. (Previously presented) The method according to claim 40, wherein said detecting comprises detecting binding of a first decoder binding ligand (DBL) to said first IBL and a second decoder binding ligand to said second IBL.

42. (Cancelled)

43. (Previously presented) The method according to Claim 40, wherein said first and second IBLs comprise a nucleic acid.

44. (Cancelled)

45. (Previously presented) The method according to Claim 40, wherein said first and second IBLs are attached to said first subpopulation of microspheres at a first ratio and are attached to said second population of microspheres at a second ratio.

46-54 (Cancelled)

55. (Previously presented) A method of decoding the position of a bioactive agent on an array substrate comprising:

a) providing an array substrate comprising randomly distributed microspheres, wherein each microsphere comprises:

i) a bioactive agent; and

ii) a combination of different identifier binding ligands (IBLs), wherein said combination uniquely identifies said bioactive agent;

b) adding a first decoder binding ligand (DBL) to the array substrate, wherein the first DBL binds to an IBL in said combination;

c) identifying the position of the IBL that binds to the first DBL;

d) adding a second DBL to the array, wherein the second DBL binds to another IBL in said combination;

e) identifying the position of the IBL that binds to the second DBL; and

f) decoding the position of said bioactive agent on said array substrate based on the position on the array substrate of the IBLs that bind the first and the second DBLs.

56. (Currently amended) The method of Claim 55, wherein said combination of IBLs and said first and second DBLs each comprise single strand nucleic acid.

57. (Previously presented) The method of Claim 56, wherein said nucleic acid is DNA.

58. (Previously presented) The method of Claim 56, wherein said nucleic acid is RNA.

59. (Previously presented) The method of Claim 56, wherein said combination of IBLs and said first and second DBLs are oligonucleotides of about 8 to about 40 basepairs in length.

60. (Previously presented) The method of Claim 55, wherein said microspheres comprise 10 IBLs.

61. (Previously presented) The method of Claim 55, wherein said first DBL binds to said IBL with a dissociation constant of less than about 10^{-5} - 10^{-9} M⁻¹.

62. (Previously presented) The method of Claim 55, wherein said second DBL binds to said IBL with a dissociation constant of less than about 10^{-5} - 10^{-9} M⁻¹.

63. (Previously presented) The method of Claim 55, wherein said first and second DBLs comprise a fluorophore.